PACE®

ISO 9001 CERTIFIED

# ST 20A Systems

## Operation & Maintenance Manual

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Since 1958, PACE Incorporated has provided advanced technology training in all aspects of hand soldering, rework and repair.

Additional copies of this manual or other PACE literature may be obtained from:

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# REV. C

## SYSTEM QUICK START

The ST 20A systems are very easy to operate. ST 20A-SP systems (using SP-2A Sodr-Pen handpiece) can be quickly set up for use in standard soldering operations. **To begin operation of a ST 20A-SP system quickly, perform the "Set-Up" and "Operation" procedures detailed on pages 7-11 and page 16 of this manual.** A shaded title bar on each of these pages highlight their location.

When performing other operations (e.g., applications requiring use of large SMT tips), PACE recommends that the user read and fully understand all of the "Operation" portion of this manual in order to utilize the features of this system. ST 20A-TT and ST 20A-PS systems are shipped with an additional manual which should be read and fully understood before operating those systems.

For any questions regarding this Operation & Maintenance Manual, contact your local authorized PACE distributor or contact PACE directly at:

Telephone (301) 490-9860, Fax (301) 604-8782

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**Laurel MD 20723-1990**

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## Introduction

Thank you for purchasing the PACE model ST 20A Soldering System. This manual will provide you with the information necessary to properly set up, operate and maintain the system. Please read this manual thoroughly before using the system.

The ST 20A systems utilize the model PPS 15A power source which incorporates a highly responsive SensaTemp (closed loop) control system providing up to 80 Watts of total power to a single output channel.

The ST 20A systems are available in either the 115 VAC, 230 VAC or 100 VAC version. The 230 VAC version system bears the CE Conformity Marking which assures the user that it conforms to all the requirements of council directive EMC 89/336/EEC. The systems package the power source with a selection of accessories and functional aids. These systems are as follows:

**ST 20A-SP** - Consists of the PPS 15 power source (115 VAC, 230 VAC or 100 VAC version), SP-2A Sodr-Pen, SP Tip & Tool Stand and accessory kit. The standard SP-2A Sodr-Pen (uses 3/16" shank tips) provides high capacity heating necessary to perform thru-hole soldering and SMT component removal/replacement operations.

**ST 20A-TT** - Consists of the PPS 15 power source (115 VAC, 230 VAC or 100 VAC version), TT-65 ThermoTweez handpiece, TT Tip & Tool Stand and accessory kit. The standard TT-65 ThermoTweez handpiece provides safe, one-handed removal of a wide variety of components (PLCCs, SOICs, PQFPs, BQFPs, SMT Connectors etc.) in a matter of seconds. Its low temperature, high capacity heating can remove even the largest components quickly and easily.

**ST 20A-PS** - Consists of the PPS 15 power source (115 VAC, 230 VAC or 100 VAC version), PS-50 Prep-Set and accessory kit. The standard PS 50 Prep-Set is a fully integrated system for easily fluxing and tinning leads, wires and dressing soldering tips, even pre-heating components before final soldering.

Other available PACE SensaTemp handpieces may be used with the ST 20A system to perform a wide variety of advanced surface mount & thru-hole component removal/replacement operations. These include:

SX-70 Sodr-X-Tractor Handpiece  TJ-70 Mini ThermoJet Handpiece
TP-65 ThermoPik Handpiece

These handpieces require an air source. Any of these handpieces can be used if the system power source is connected to a PACE ST 60 system (via PaceLink Receptacle). Alternatively, a Ped-A-Vac III Foot Pedal may be purchased and connected to a 60-90 p.s.i. air supply to provide a vacuum source for the TP-65 and SX-70 air handpieces.

## Specifications

### System Power Source Power Requirements

The system power sources are available in either the 115 VAC, 230 VAC or 100 VAC version as listed below.

PPS 15A (ST 20A system) - Operates on 97-127 VAC, 50/60Hz, 90 Watts maximum at 115 VAC, 60Hz

PPS 15AE (ST 20AE system) - Operates on 197-264 VAC 50/60Hz, 80 Watts maximum at 230 VAC, 50Hz

PPS 15AJ (ST 20AJ system) - Operates on 90-115 VAC 50/60Hz, 80 Watts maximum at 100 VAC, 50/60Hz

### Temperature Specifications

#### Handpieces

Tip Temperature Range

93°C to 482°C (200°F to 900°F) nominal.

Temperature Stability

±1.1°C (±2°F) at idle from set tip temp.

#### PS 50 Prep-Set

Temperature Range

93°C to 371°C (200°F to 700°F) nominal.

**NOTE** - Actual minimum and maximum Operating Tip Temperatures may vary depending on Handpiece (or PS 50), Tip Selection and application.

### EOS/ESD Specifications

The specifications shown below apply except on "Soft Ground Systems" which have a 1 meg ohm current limiting resistance and a label placed on the power source front panel referring to EN 100015-1.

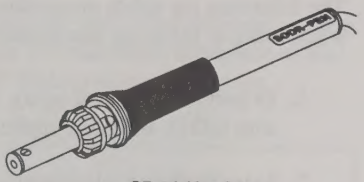
#### Tip-To-Ground Resistance

Less than 5 ohms.

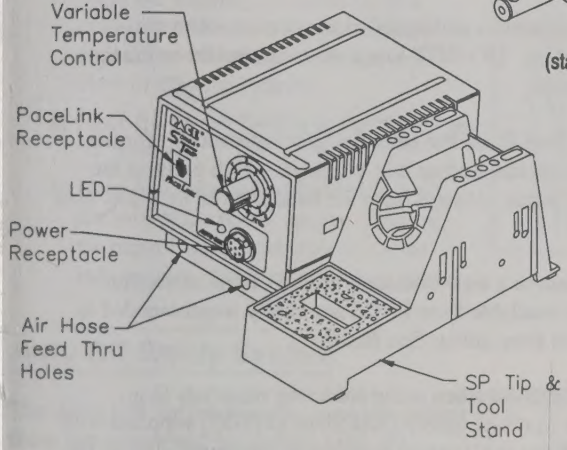
#### AC Leakage

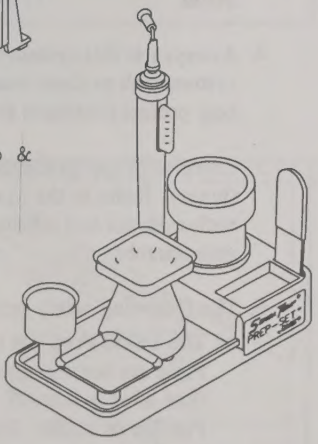
Less than 2 Millivolts RMS from 50Hz to 500Hz.

## Parts Identification

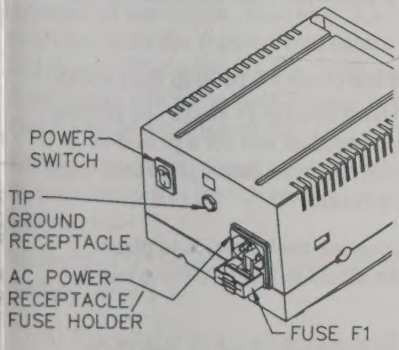


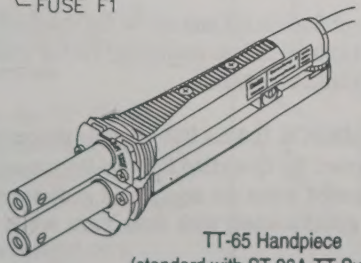
SP-2A Handpiece
(standard with ST 20A-SP Systems)



PS-50 PrepSet
(standard with ST 20A-PS Systems)



TT-65 Handpiece
(standard with ST 20A-TT Systems)

## Safety

The following are safety precautions which personnel must understand and follow when using or servicing this product.

1. To prevent personnel injury, adhere to safety guidelines in accordance with OSHA and other applicable safety standards.

2. SensaTemp handpiece heaters and installed tips are hot when the handpiece is powered on. **DO NOT** touch either the heater or the tip. Severe burns may result.

3. The enclosed Tip & Tool Stand has been designed specifically for use with the your handpiece and houses it in a manner which protects the user from accidental burns. Always store the handpiece in its Tip & Tool Stand.

4. Always use this system in a well ventilated area. A fume extraction system such as those available from PACE are highly recommended to help protect personnel from solder flux fumes.

5. Exercise proper precautions when using soldering materials (e.g., fluxes). Refer to the Material Safety Data Sheet (MSDS) supplied with each material and adhere to all safety precautions recommended by the manufacturer.

6. The following safety precautions cover use of the PS 50 Prep-Set system.
   a) The PS-50 Prep-Set heater and installed Pot-Tip (+ solder) or Preheat Plate are hot when the Prep-Set is powered on and for a period of time after power off. **DO NOT** touch either the heater, Preheat Plate, Pot-Tip or solder. Severe burns may result.

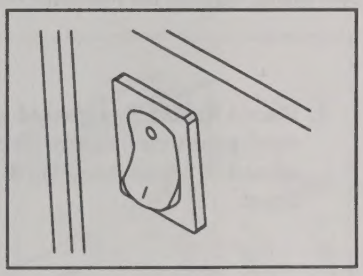
   b) Insure that the rubber heat shield (covering the heater) is in place. Never operate the system without the shield in place. Severe burns may result.

   c) Turn the Power Switch off and allow the installed solder Pot-Tip or Preheat Plate to cool before changing. Never touch a hot Pot-Tip or Preheat Plate with bare hands.

7. **POTENTIAL SHOCK HAZARD** - Repair procedures on this product should be performed by Qualified Service Personnel only. Line voltage parts will be exposed when the equipment is disassembled. Service personnel must avoid contact with these parts when troubleshooting the system.

Set up the ST 20A system using the following steps and associated drawings. If you have purchased a system which includes the TT-65 ThermoTweez handpiece or the PS 50 Prep-Set system, refer to their Operation & Maintenance manuals for applicable set-up instructions for those items.

1. Store the shipping container(s) in a convenient location. Reuse of these containers will prevent damage if you store or ship the system.
2. Place the Power Switch in the "OFF" or "0" position.
3. Place 4 of the supplied Rubber Feet on the base of the power source. Remove the paper backing and place in corner indentations. Refer to illustration below.



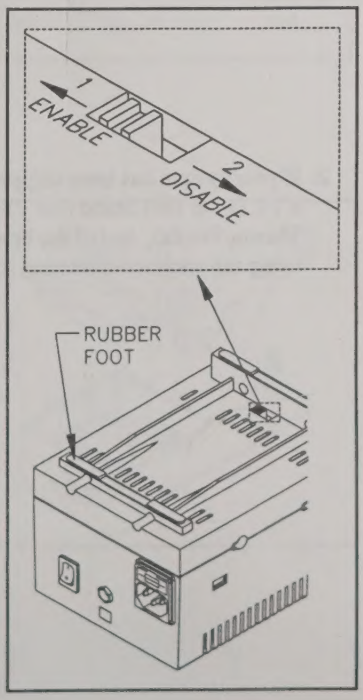
## Auto Off Safety System

The Auto Off Safety System removes power from the connected handpiece after 90 minutes of handpiece inactivity. As received from the factory, the feature is Disabled ("2" position). The LED on the front panel will illuminate Yellow in color (with handpiece connected).

Refer to the description of the Auto Off Safety System detailed in the "Operation" portion of this manual.

To Enable ("1" position) the Auto Off feature, perform steps 1-3.

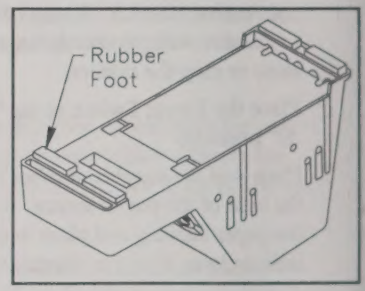
1. Place the power source on a work surface with the bottom facing up as shown in the illustration.
2. Move the switch to the "1" (Enable) position. During normal use, the LED will now be illuminated Green in color (with handpiece or PS-50 connected).
3. Position the system upright on a convenient bench.



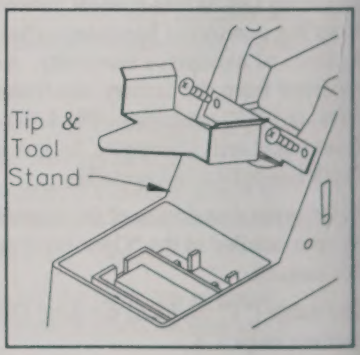
## Tip & Tool Stand

If your system has been shipped with a Tip & Tool Stand, perform the following procedure.

1. Place 4 Rubber Feet (packed with small accessories) on the bottom corners of any enclosed Tip & Tool Stand.




2. If your system has been shipped with a TT Tip & Tool Stand (for TT-65 ThermoTweez), install the bracket using the enclosed mounting screws.

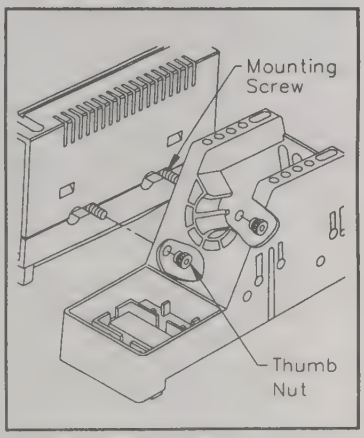


3. The Tip & Tool Stand may be used as "free standing" or may be attached to either side of the power source. Attach the stand using the following procedure.

   a) Insert the 2 enclosed Mounting Screws (head first) into the 2 power source mounting slots shown. Slide the screws toward the rear of the power source.

   b) Place the Tip & Tool Stand beside the power source, inserting ends of the 2 Mounting Screws into the 2 Tip & Tool Stand mounting holes shown.

   c) Install a knurled Thumb Nut onto the end of each Mounting Screw. Tighten Thumb Nuts to secure the stand in position.

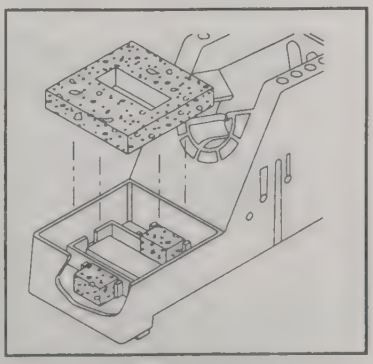



4. Place the supplied sponge in the Tip & Tool Stand using the following procedure.

   a) Remove the 2 small punched out center portions of the sponge & place into the sponge well of the stand in the position shown.

   b) Place the large sponge section into the sponge well as shown.

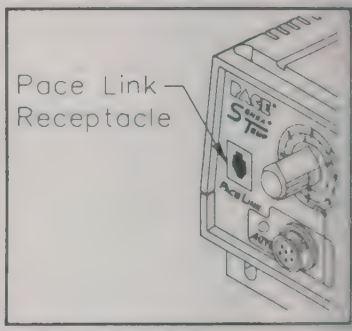
   c) Dampen the sponges with water.



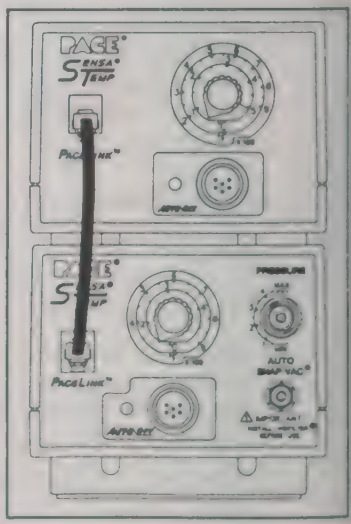
5. Place the handpiece into its Tip & Tool Stand.

## PaceLink

The PaceLink Receptacle on the front panel of the power source allows the operator to activate the **AUTO SNAP-VAC** and Controllable **PRESSURE** features of a ST 60 system power source. If an air handpiece (SX-70, TP-65 or TJ-70) is connection to the ST 20A, actuation of its finger switch will activate air flow through the **AUTO SNAP-VAC** and Controllable **PRESSURE** ports of the ST 60 system. To link your ST 20A system to a ST 60 system, perform the following procedure.




1. The 2 systems should be positioned adjacent to each other. They can be placed side by side or may be stacked one on top of the other. Place your ST 20A system beside or stack with your ST 60 system.
2. Use a PaceLink cable (available from your local PACE distributor) to connect the systems. Place the plugs on the ends of the cable into the PaceLink Receptacles on both systems.
3. Ensure that a VisiFilter assembly is connected to the ST 60 **AUTO SNAP-VAC** Port.
4. Connect the Air Hose of the handpiece currently in use to the VisiFilter assembly or Controllable **PRESSURE** Port.



**CAUTION**

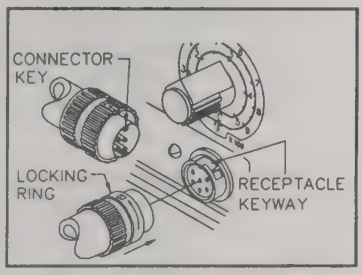
Systems connected together through the PaceLink must be used and controlled by a single operator. Any attempt to operate by more than one individual can create a hazard condition and will cause a deterioration in performance.

Ensure that only one air hose is connected to the **AUTO SNAP-VAC** or Controllable **PRESSURE** port at one time. Attachment to both ports simultaneously will cause a deterioration in performance.

## Handpiece Connection

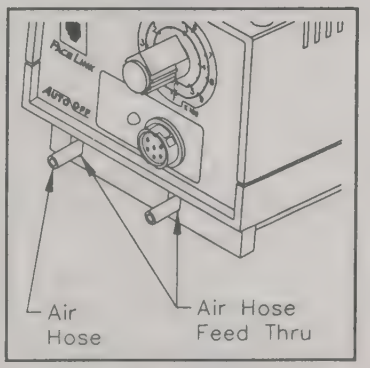
Connect the handpiece (or PS 50) connector plug into the Power Receptacle in the following manner.

1. Turn the Locking Ring fully counterclockwise with the Connector Key end facing the power source.
2. Align the Connector Key with the Receptacle Keyway.
3. Insert the connector into the power receptacle.
4. Turn the Locking Ring fully clockwise to secure in place.




## Air Hose Routing

When using an Air Handpiece (e.g., SX-70 Sodr-X-Tractor) or a Tip-Evac Fume Extraction System, any associated air hose(s) can be routed through the 2 Air Hose Feed Thru holes located on the bottom of the power source.




## System Power Up

1. Insert the female end of the power cord into the AC Power Receptacle at the rear panel of the power source.
2. Plug the prong end (male end) of the power cord into a 3 wire grounded AC supply receptacle. The system is now ready for operation.

**CAUTION**

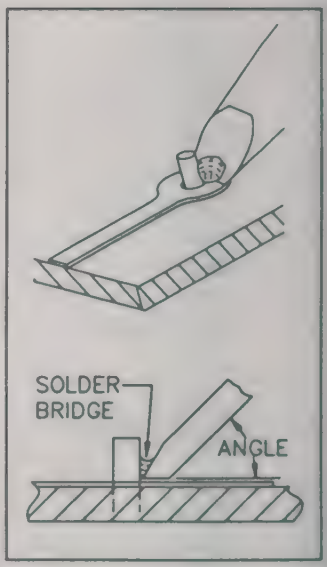
To insure operator safety, the AC supply receptacle must be checked for proper grounding before initial operation.

3. Read the "Operation" section of this manual thoroughly before operating the system. Included is a description of Sodr-Pen operation. Shipped with ST 20A-TT and ST 20A-PS systems is an additional Operation & Maintenance manual which details operation of the TT-65 ThermoTweez handpiece or PS-50 Prep-Set.

## Sodr-Pen Tip Selection & Use

1. **HEAT TRANSFER**: Maximize thermal transfer by selecting the shortest, fattest tip with the largest surface contact area which appropriately fits the work. Keep the tip clean and freshly tinned and clean the work of oxides or other residues.

   When soldering, angle the tip to the joint so that there is maximum surface contact area. The use of a "solder bridge" to enhance "thermal linkage" will also improve heat transfer.

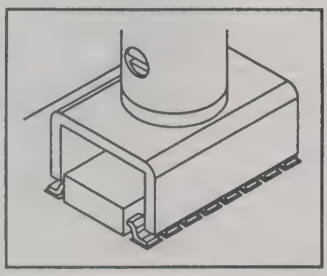



2. **TIP ACCESS & VISIBILITY:** The tip selected must easily contact the joint without touching the board substrate, adjacent components or other solder joints.

   Longer, thinner, more tapered tips allow the operator to more easily access and view the solder joint during soldering for better process control. However, such tips generally have much less heat transfer ability than shorter, fatter tips.

3. **TIP TEMPERATURE:** Use the lowest tip temperature which will achieve rapid yet controllable melt of the entire joint(s). Begin with a temperature of 316°C (600°F) and adjust as necessary to suit the particular application and operator skill level. Lower tip temperatures reduce the risk of damage and increase tip life.

4. **SMT REMOVAL:** Tips for SMT removal applications must fit over (or around) the component body, and contact all the solder joints at once. When all the solder joints reflow completely, remove the component.



5. **SODR-PEN HANDPIECES:** The SP-2A Sodr-Pen (comes standard with your ST 20A-SP system) uses 3/16" shank tips providing maximum heat transfer for Surface Mount and multilayer board applications.

   The optional SP-1A Sodr-Pen uses 1/8" shank tips and features a slimmer, more compact heater for easier access on densely populated assemblies.

## Available Tips

Shown below is a partial listing of available single point tips plus illustrations of different tip configurations. Contact your local authorized PACE distributor for the Tip & Applications catalog which contains a complete list of tips.

| 3/16" SHANK TIPS (for SP-2A Sodr-Pen) | |
|---|---|
| DESCRIPTION | PART # |
| 1/64" Conical | 1121-0357 |
| 1/64" Bent Conical | 1121-0363 |
| 1/32" Chisel | 1121-0359 |
| 1/32" Bent Chisel | 1121-0361 |
| 1/32" Conical | 1121-0336 |
| 1/16" Chisel (MicroFine) | 1121-0349 |
| 1/16" Chisel | 1121-0335 |
| 1/16" Chisel (High Capacity) | 1121-0414 |
| 1/16" Chisel (Extended Reach) | 1121-0499 |
| 1/16" Bent Chisel (Ext. Reach) | 1121-0500 |
| 3/32" Chisel | 1121-0360 |
| 1/8" Chisel | 1121-0337 |
| 3/16" Chisel | 1121-0358 |
| Single Sided Chisel | 1121-0406 |
| 1/4" Flat Blade | 1121-0402 |
| 0.40" Flat Blade | 1121-0305 |
| Mini-Wave | 1121-0490 |

| 3/16" SHANK EXTENDED REACH TIPS (for SP-2A Sodr-Pen) | |
|---|---|
| DESCRIPTION | PART # |
| 1/64" Conical | 1121-0528 |
| 1/32" Conical | 1121-0527 |
| 1/16" Chisel | 1121-0533 |
| 3/32" Chisel | 1121-0529 |
| 1/8" Chisel | 1121-0530 |
| 3/16" Chisel | 1121-0531 |
| Single Sided Chisel | 1121-0532 |
| **3/16" SHANK THERMO-DRIVE TIPS (for SP-2A Sodr-Pen)** | |
| 1/64" Conical | 1121-0516 |
| 1/64" Bent Conical | 1121-0526 |
| 3/64" Chisel | 1121-0524 |
| 3/64" Bent Chisel | 1121-0525 |
| 1/16" Chisel | 1121-0510 |
| 1/8" Chisel | 1121-0518 |
| **1/8" SHANK TIPS* (for SP-1A Sodr-Pen)** | |
| 1/32" Conical | 1121-0503 |
| 1/16" Chisel | 1121-0502 |
| 1/8" Chisel | 1121-0501 |
| Single Sided Chisel | 1121-0504 |

***These tips (1/8" shank) can be installed in the SP-2A Sodr-Pen using the PACE AdapTip (Part Number 1360-0083-P1).**

*Table I. Single Point Tips*

1/8" Shank Conical Tip

3/16" Shank Thermo-Drive Tip

SOIC Tip

Socket Tip

FlatPack Tip

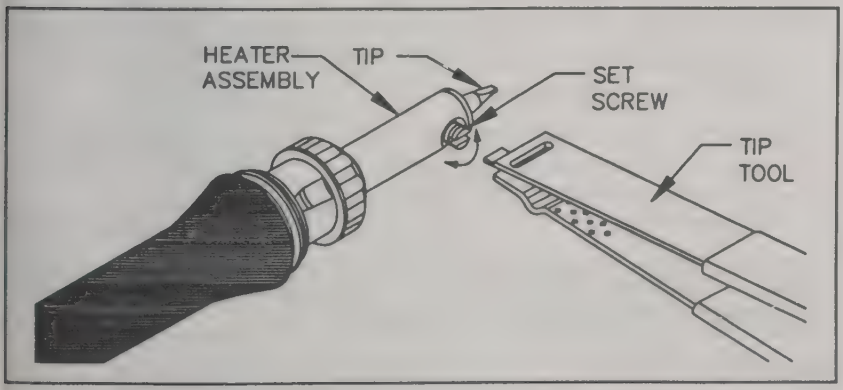
## Sodr-Pen Tip Installation

For maximum productivity and proper fit, install tips into your Sodr-Pen when the heater is hot.

**CAUTION**

Hold the handpiece with the heater pointed at an angle up to prevent injury to personnel.

1. Select the proper tip for your application. Refer to Table I or the PACE Tip & Applications Catalog.
2. Install the selected tip in the following manner.
   a) Hold the handpiece with the heater up at an angle (heater hot).
   b) Insert the Tip all the way into the heater bore using the supplied Tip Tool.
   c) Gently tighten the heater Set Screw.
3. Recheck the tip Set Screw periodically to insure that it remains snug.



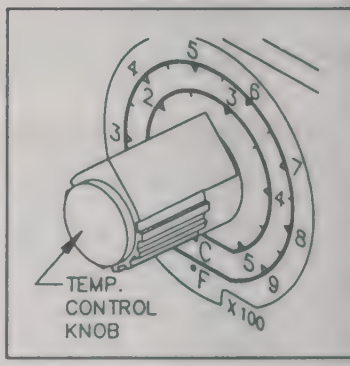

**NOTE**

Periodically, clean the heater bore with a properly sized wire brush (3/16" O.D. for SP-2A and 1/8" O.D. for SP-1A) to insure optimum heat transfer and proper tip grounding.

## Temperature Selection

### Variable Temperature Control

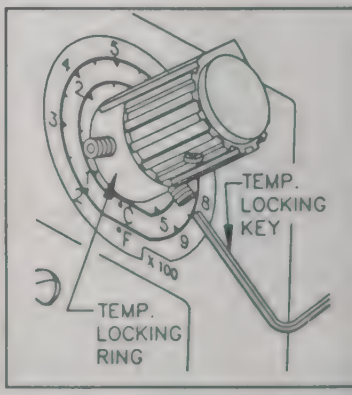
Adjust the Variable Temperature Control Knob to the desired temperature setting. Notice that the control dial has a White graphic scale denoting temperature in °C (Celsius) and a Yellow graphic scale denoting temperature in °F (Fahrenheit). These numerical scales denote the set tip temperature times 100 (e.g., "3" on the White scale is 3 x 100 or 300°C).




### Temperature/Dial Lock

The Variable Temperature Control Knob can be locked in position (at one temperature) to avoid accidental or unauthorized changes of the temperature setting. Perform the following procedure to lock the Variable Temperature Control Knob.

1. Adjust the Temp. Control Knob to the desired temperature setting.
2. Using the Temp. Locking Key (hex head wrench) included with the system, tighten the 2 set screws on the Temp. Locking Ring.




**NOTE** - Temperature will remain at its locked setting, even if the Variable Temperature Control Knob is forced to move.

### Tip Offset

Differences between the temperature settings and true tip temperatures are negligible when using Thru-Hole, single point soldering tips. With any heating system however, True Tip Temperatures can differ greatly from temperature settings when using larger SMT soldering tips. This difference is called Tip Temperature Offset. PACE recommends the use of the Tip & Temperature Selection System booklet (PACE P/N 5050-0251) as a guide to accurately set and maintain a true tip temperature for any size and type of SMT tip.

## LED Operation

The tri-colored (Red, Green and Yellow) LED on the power source front panel indicates System Status (by color illumination) and Power Receptacle output status (LED OFF, ON or Flashing). Following is an explanation of these status indicators. Refer to the illustration at the bottom of this page.

**Green Illumination** - Auto Off Safety System feature "Enabled".

**Yellow Illumination** - Auto Off Safety System feature "Disabled".

**Red Illumination** - Auto Off Safety System feature has turned system power off or the connected handpiece is faulty (see Corrective Maintenance section). Turn the system Power Switch off ("0") and then back On ("1") to reset the system.

**LED Full On** - Continuous power is being delivered to the handpiece. This condition is evident when the system is first powered up (handpiece heater cold) or the Variable Temperature Control setting is increased.

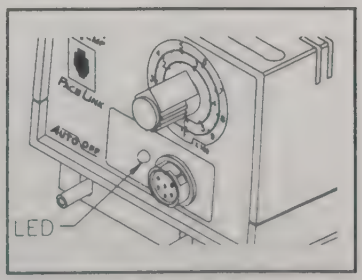
**LED Flashing** - Indicates that the set tip temperature (as set on the Variable Temperature Control) has been reached. Power to the handpiece is cycling Off and On to maintain set temperature.

**LED Off** - No power is being delivered to the handpiece heater. This condition is evident if the Variable Temperature Control setting is decreased. If the LED never illuminates, check for a faulty handpiece (see Corrective Maintenance section).

## Auto Off Safety System

The Auto Off Safety System is a feature which, when Enabled, (see Set-Up section of this manual) removes power from the connected handpiece after 90 minutes of handpiece inactivity.

During normal use with this feature enabled, the LED on the power source will be illuminated Green in color (may be flashing). When the system goes into Auto Off Mode, the LED will illuminate Red in color.




**To resume normal operation, the Power Switch (on rear panel) must be turned Off ("0") position and then back On ("1").**

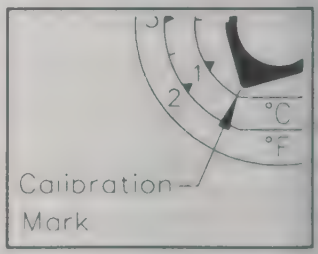
## Calibration

The ST 20A system can be checked for calibration according to PACE requirements. Also, a temperature setting normally used by the operator can be adjusted to the precise temperature indicated on the Dial/Display. No internal adjustments can be made to the power supply. To verify calibration of the power supply, perform the following procedure.

1. Install a tip with an attached thermocouple wire into the handpiece connected to the system. Tips with K type thermocouples are available from PACE; use part number 7021-0004-P1 when ordering.

2. Connect the thermocouple assembly to a PACE Process Monitor (part number 8001-0077 or 8001-0078) or appropriate temperature meter.

3. When set fully counterclockwise,the pointer of the Variable Temperature Control knob will align to the Calibration Mark as shown. With the system turned on, adjust the Variable Temperature Control to obtain a stable tip temperature of 300°C (for PACE factory specifications) or the temperature setting normally used by the operator.

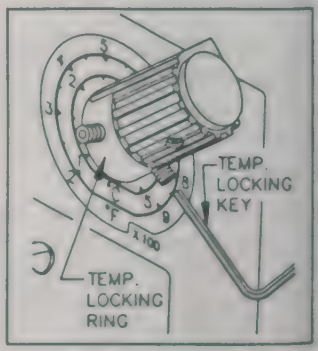



If the temperature displayed on the Process Monitor (or temperature meter) is within ±5°C (10°F), perform steps 4 thru 6 to obtain a precise reading. If the temperature is off by more than ±5°C, the handpiece may require maintenance. Recheck the temperature using a second handpiece.

4. Carefully lock the Variable Temperature Control in position by tightening the 2 inner set screws (on Temp. Locking Ring).

5. Loosen the set screw on the Variable Temperature Control knob. Position the knob with the pointer aligned to match the temperature indicated on the Process Monitor (or temperature meter). Secure the knob in position by tightening the set screw.

6. Loosen the 2 inner set screws (on Temp. Locking Ring) to unlock the Variable Temperature control if adjustment of operating tip temperature is desired.



## Power Source

Most malfunctions are simple and easy to correct. Refer to Table II below to clear these malfunctions.

| Symptom | Probable Cause | Solution |
|---|---|---|
| No power to system. | Blown Fuse | Check handpiece using Table III . Replace the fuse (located in the AC Receptacle/Fuse Holder) with one of same value (see Table V parts list). |
| No heat on handpiece. | Defective Heater | See Table III below or refer to handpiece Manual. |

*Table II. Power Source Corrective Maintenance*

## Handpieces

The following "Heater Assembly Checkout Procedures" (Table III) is applicable to all PACE SensaTemp handpieces used with the ST 20A system except for the ThermoTweez (TT-65) handpiece. Refer to either of the TT-65 manuals (5050-0300 or 5050-0336) for troubleshooting procedures pertinent to that handpiece.

Perform the procedures with the handpiece (and heater) at room temperature. If the handpiece is warm, resistance readings will be different from those shown. Disconnect the handpiece from the power source. Use a meter to check resistance across the handpiece connector plug pins as outlined in the "Checkout Procedure" column.

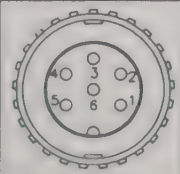
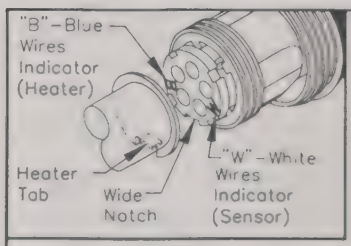
| Symptom | Checkout Procedure | Cause | Solution | Heater Specifications |
|---|---|---|---|---|
| No heat | Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is high - - | Open Heater | Replace Heater Assembly. | SP-1A = 10-12 ohms<br>SP-2A = 8-10 ohms<br>SX-70 = 8-10 ohms<br>TP-65 = 9 - 11 ohms |
| | Check resistance - Pin 3 to Pin 6. If circuit reads open - - | Open Sensor | Replace Heater Assembly. | |
| Handpiece overheating LED is Red | Check resistance - Pin 3 to Pin 6. Resistance should be 110 ohms. If resistance is less than 105 ohms - - | Shorted Sensor | Replace Heater Assembly. | |
| Fuse blows when unit is turned on. | Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is low - - | Solder short in Handpiece. | Remove Short. Replace Heater Assembly & Fuse1. |  Connector Plug Pinouts |
| | | Shorted Heater | Replace Heater Assembly & Fuse. | |
| No Ground on Tip. | Check resistance - Pin 4 to a NEW Tip. Resistance should be less than 2 ohms. If not - - | Oxidation in Heater Bore. | Clean Heater Bore using appropriate wire brush. | |
| | | Defective Heater | Replace Heater Assembly. | |

*Table III. Heater Assembly Checkout Procedures*

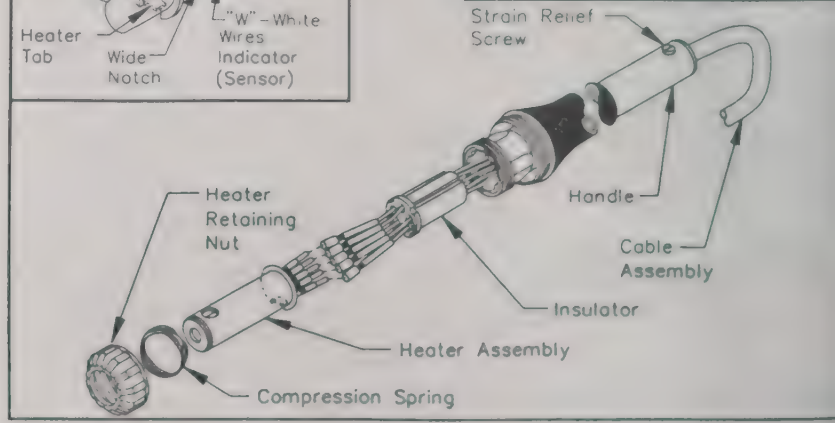
## SODR-Pen Heater Replacement

Insure that the installed heater assembly of your Sodr-Pen handpiece is defective by referring to Table III. If replacement becomes necessary, follow the procedure below.

1. Disconnect the Sodr-Pen from the power source.
2. Unscrew, remove and discard the Heater Retaining Nut. If the Heater Retaining Nut does not unscrew easily, gently apply a back and forth side force to the tip end of the Heater Assembly to release the heat seal created after extended use.
3. Loosen the white plastic Strain Relief Screw (if present) located at the rear of the Handle. Gently push the Cable Assembly through the Sodr-Pen (toward the Heater Assembly) to expose the Insulator. Slide the Insulator back (toward the Handle end) to expose the 5 lead wire connections between the Heater Assembly and the Cable Assembly.
4. Disconnect the 5 Heater Assembly leads. Remove the Insulator from the Cable Assembly leads. Discard the old Heater Assembly and Insulator.
5. Feed the Cable Assembly leads back through the replacement Insulator with the notched end of the Insulator facing the Heater Assembly end. Feed the 2 Blue leads through the holes marked with the letter "B" and the 2 White leads through the holes marked "W". Feed the Green lead through the unmarked hole. Insure that the Cable Assembly leads do not become crossed with each other.




| Heater To Cable Assembly Connections | | |
|---|---|---|
| Heater Leads | | Cable Assembly Leads |
| 2 Blue Leads | To | 2 Blue Leads |
| 2 Tan Leads | To | 2 White Leads |
| Bare Lead | To | Green Lead |



6. Plug the wire leads of the replacement Heater Assembly into the wire leads of the Cable Assembly using the table shown in the illustration as a reference. Match like colored wires. Connect the Green Cable Assembly lead to the non-insulated Heater Assembly lead. Insure that the leads do not become crossed with each other.

7. Slide the Insulator over the lead connections and against the back of the heater housing. The metal tab on the heater housing (Heater Tab) must slide in the Wide Notch (see illustration) on the end of the Insulator.

8. Gently pull the Cable Assembly back through the handpiece until the Heater Assembly rests against the plastic Handle. Gently twist the Heater Assembly (if necessary) to slide the narrow notches on the Insulator between the tabs on the inside of the Handle.

9. Place the new metal Compression Spring over the end of the Heater Assembly .

10. Install the new Heater Retaining Nut to secure the Heater Assembly and rubber Compression Spring to the Handle.

11. Tighten the white plastic Strain Relief Screw (if present) located at the rear of the Handle until the screw is flush with or just above the Handle surface to secure the cable assembly in position. A replacement screw is supplied in the event that replacement becomes necessary.

12. Perform the Burn In procedure (listed on the Red tag packaged with the replacement Heater Assembly) to insure long life.

## SP-1A/SP-2A Handpieces

Listed are the replacement parts which may be ordered through your local authorized PACE distributor. To obtain any other replacement parts, contact PACE Customer Service directly at Tel. #(301) 490-9860 or FAX #(301) 604-9215.

| Item # | Description | Part Number |
|---|---|---|
| 1 | SP-1A Sodr-Pen Handpiece | 6025-0013-P1 |
| 2 | SP-1A Heater Assembly (37 Watt) | 6010-0085-P1 |
| 3 | SP-2A Sodr-Pen Handpiece | 6025-0014-P1 |
| 4 | SP-2A Heater Assembly (54 Watt) | 6010-0086-P1 |
| 5 | Heater Set Screw | 1348-0547-P10 |

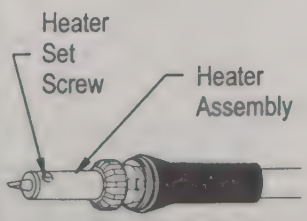



*Table IV. SP-1A/SP-2A Parts*

## Accessory Tray Items

Listed below is a packing list of the items shipped with the system. This list is current at the time of publication of this manual.

*ACCESSORY TRAY ITEMS (PACKING LIST)*

| ITEM NO. | DESCRIPTION | PART NUMBER | QUANTITY SUPPLIED | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | -SP SYSTEMS (with SP-2A Sodr-Pen) | | -TT SYSTEMS (with TT-65 ThermoTweez) | | | -PS SYSTEMS (with PS 50 Prep-Set) | | |
| | | | ST 20A | ST 20AJ | ST 20AE | ST 20A | ST 20AJ | ST 20AE | ST 20A | ST 20AJ | ST 20AE |
| 1 | SP-2A Sodr-Pen (54 Watts) | 6025-0014-P1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | TT-65 ThermoTweez Handpiece | 7025-0001-P1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 3 | PS 50 Prep-Set | 7014-0003 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 4 | Power Supply Cord, 100 & 115 VAC | 1332-0094 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 5 | Power Supply Cord, 230 VAC | 1332-0093 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 6 | SP Tip & Tool Stand | 6019-0043 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | TT Tip & Tool Stand | 6019-0046 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8 | Sponge for Tip & Tool Stand | 4021-0008-P3 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 9 | Wire Brush, 3/16 inch diameter | 1127-0014-P5 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 10 | Tip Tool | 1100-0206 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 11 | Hex Wrench (Temp. Locking Key) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | Rubber Foot | | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 |
| 13 | Screw, 8-32 x 1/2" Long | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| 14 | Thumb Nut, Knurled, 8-32 | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |

*Table V. Accessory Tray Items*

## *Optional & Accessory Items*

Listed below are available optional and accessory items which may be through your local authorized PACE distributor.

*OPTIONAL & ACCESSORY ITEMS*

| ITEM NO. | DESCRIPTION | PART NUMBER |
|---|---|---|
| 1 | Fuse, 1.0 Amp Time Lag (PPS 15A) | 1159-0246 |
| | 0.5 Amp Time Lag (PPS 15AE) | 1159-0213 |
| | 1.25 Amp Time Lag (PPS 15AJ) | 1159-0217 |
| 2 | SP-1A Sodr-Pen (37 Watts) | 6025-0013-P1 |
| 3 | Wire Brush, 1/8 inch diameter | 1127-0006-P5 |
| 4 | AdapTip Kit (for SP-2A Sodr-Pen) | 1360-0083-P1 |
| 5 | Tip & Temperature Selection System Booklet. | 5050-0251 |
| 6 | V-SX Vacuum Option (solder extraction) | 6993-0131 |
| 7 | SX Tip & Tool Stand (for air handpieces) | 6019-0044 |
| 8 | Tip Redi-Rak | 6021-0007 |
| 9 | SMD Tip Accessory Kit | 6993-0170 |
| 10 | Replacement Fiber Filler | 1127-0013-P2 |
| 11 | Replacement Sponge Filler | 4021-0006-P5 |
| 12 | Cord Retention System | 6018-0090 |

*Table VI. Optional And Accessory Items*

## *MANUAL IMPROVEMENT & COMMENT FORM*

### *Instructions*

1. Duplicate this form and submit comments on the copy. Keep the original to make future comments.
2. Please complete all requested information.
3. Submit completed form to:

PACE Incorporated
Applications Engineering Fax: (301) 604-8782
9893 Brewers Court
Laurel, MD 20723-1990 U.S.A.

| Document # | 5050-0355 | Rev. C | Date of Submission: |
|---|---|---|---|

Nature of Change (Identify page and paragraph and include proposed rewrite, if possible.)

Reason for Recommendation

| Name of Submitter: | Company or Organization: |
|---|---|
| Mailing Address: | Telephone: ( ) |
| | Voice: |
| | Fax: |

Thank you for your comments. They are greatly appreciated!